

## WIRE WINDING DEVICE FOR ELECTRICAL APPLIANCES

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The invention relates to a wire winding device, more particularly to a wire winding device that is suitable for an electrical appliance.

#### 2. Description of the Related Art

Referring to Figures 1 and 2, a conventional wire winding device 10 is shown to be incorporated on a press iron 1, and includes a hollow housing 11, and a winder 12 disposed within the housing 11. The housing 11 includes a base plate 111 and a cover unit 112 that cooperates with the base plate 111 to define a receiving space 13 for receiving the winder 12 therein. The cover unit 112 is formed with a through hole 113 that is in communication with the receiving space 13. The winder 12 includes a reel member 121 mounted rotatably on the base plate 111. An electrical wire 122 is wound on the reel member 121, and is connected electrically to an inner component of the press iron 1. The winder 12 further includes a spring member 123 for biasing the reel member 121 to rotate in a direction, and a control knob 124 for controlling the biasing action of the spring member 123.

The electrical wire 122 can be pulled out of the receiving space 13 through the through hole 113 to connect with a power supply during use. When the control

knob 124 is pressed, the biasing action of the spring member 123 causes the electrical wire 122 to wind on the reel member 121 for storage.

Although the conventional wire winding device 10 can achieve its intended purpose, an outer layer of the electrical wire 122 wears off easily due to frictional contact with a wall of the cover unit 112 that defines the through hole 113, thereby rendering the wire winding device 10 or the whole press iron 1 inconvenient and dangerous to use.

#### **SUMMARY OF THE INVENTION**

Therefore, the object of the present invention is to provide a wire winding device that is capable of overcoming the aforementioned drawback of the prior art.

According to this invention, a wire winding device for an electrical wire of an electrical appliance comprises a hollow housing, a winder, and a roller. The hollow housing defines a receiving space, and has a through hole in communication with the receiving space. The through hole is adapted to permit extension of the electrical wire therethrough, and has first and second sides that are opposite to each other. The winder is mounted within the receiving space and is adapted for winding and unwinding the electrical wire. The roller is pivotally connected to the housing, and is disposed within the first side of the through hole. The roller is adapted to be rotated by the electrical wire when

the electrical wire moves through the through hole and contacts the roller.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

Figure 1 is a schematic side view of a press iron that incorporates a conventional wire winding device;

Figure 2 is a partly sectional schematic rear view of the conventional wire winding device of Figure 1;

Figure 3 is a schematic side view of the preferred embodiment of a wire winding device according to the present invention prior to installation on a press iron;

Figure 4 is a fragmentary schematic view, illustrating the preferred embodiment after installation on the press iron; and

Figure 5 is a partly sectional schematic rear view of the preferred embodiment.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figures 3 to 5, the preferred embodiment of a wire winding device 2 according to the present invention is adapted to be incorporated on an electrical appliance for winding and unwinding an electrical wire of the appliance, and is shown to comprise a hollow housing 3, a winder 4, a first roller 51, and a second roller 52. The electrical appliance is exemplified in

this embodiment as a press iron 6. However, the wire winding device 2 is also applicable for use with other electrical appliances, such as a vacuum cleaner, a coffee maker, etc.

5       The hollow housing 3 defines a receiving space 31 (see Figure 5), and has a through hole 32 in communication with the receiving space 31. The housing 3 includes a base plate 34 connected fixedly to a body 61 of the press iron 6, and a cover unit 33. The cover unit 33 is connected  
10       fixedly to and cooperates with the base plate 34 to define the receiving space 31. The through hole 32 is formed in an upper end portion of the cover unit 33, is adapted to permit extension of an electrical wire 41 of the press iron 6 therethrough, and has a first side 321 (see Figure  
15       3) and a second side 322 (see Figure 3) that are opposite to each other. However, it is noted that the position of the through hole 32 should not be limited as such, and can be altered according to the type of the electrical appliance. The cover unit 33 has two spaced-apart pivot  
20       holes 331 respectively proximate to the first and second sides 321, 322 of the through hole 32. The base plate 34 has two spaced-apart pivot holes 341 that are aligned with the pivot holes 331 in the cover unit 33, respectively.

25       The winder 4 is mounted within the receiving space 31, is adapted for winding and unwinding the electrical wire 41 of the press iron 6, and includes a reel member

42 (see Figure 5) mounted rotatably on the base plate 34 of the housing 3, and a spring member 43 (see Figure 5) disposed at the center of the reel member 42. The electrical wire 41 is wound inside the receiving space 31, and can be releasably wound on the reel member 42. The electrical wire 41 has a plug portion 411 disposed outside the housing 3 for connection with a power supply, and an extension portion 412 that extends from the plug portion 411 through through hole 32 and into the receiving space 31. The spring member 43 has an outer end portion connected fixedly to the reel member 42, and is controlled by a control knob 62 in a known manner. When the electrical wire 41 is pulled out of the receiving space 31, the reel member 42 rotates in a direction so that the spring member 43 can store a restoring force. When the control knob 62 is pressed, the spring member 43 biases the reel member 42 to rotate in the opposite direction so as to wind the extension portion 412 of the electrical wire 41 in the receiving space 31. Since the structure and design of the reel member 42 and the spring member 43 are already known in the art, a detailed description of the same will be dispensed with herein for the sake of brevity.

The first roller 51 is pivotally connected to the housing 3, and is disposed within the first side 321 of the through hole 32 in the cover unit 33. The first roller 51 is adapted to be rotated by the electrical

wire 41 when the electrical wire 41 moves through the through hole 32 and contacts the first roller 51.

The second roller 52 is pivotally connected to the housing 3, and is located within the second side 322  
5 of the through hole 32 in the housing 3. The second roller 52 cooperates with the first roller 51 so as to be adapted to confine the electrical wire 41 between the first and second rollers 51, 52. The second roller 52 has a structure similar to that of the first roller 51.

10 Each of the first and second rollers 51, 52 has a cylindrical body 511, 521, and two ends, each of which is formed with an integral pivot pin 512, 522 (see Figure 4). The pivot pins 512, 522 of each of the first and second rollers 51, 52 engage rotatably a respective one  
15 of the pivot holes 331 in the cover unit 33 and a respective one of the pivot holes 341 in the base plate 34.

The first roller 51 is adapted to be contacted and rotated by the electrical wire 41 when the electrical wire 41 is pulled out of the receiving space 31 through  
20 the through hole 32 in the housing 3. The second roller 52 is adapted to be contacted and rotated by the electrical wire 41 when the electrical wire 41 is wound into the receiving space 31 through the through hole 32 in the housing 3. However, it is noted that the  
25 electrical wire 41 may contact and rotate the first and second rollers at the same time when the electrical wire 41 is pulled out of or wound into the receiving space

31. Thus, regardless of whether the electrical wire 41 is pulled upward or downward, it can contact and rotate a corresponding one of the first and second rollers 51, 52.

5        From the aforementioned description of the preferred embodiment of the wire winding device 2 of the present invention, it is apparent that when the electrical wire 41 is pulled out of the receiving space 31 for use, the extension portion 412 of the electrical wire 41 can  
10       rotate the first roller 51 so that wearing of the outer layer of the electrical wire 41 can be avoided. When the reel member 42 cooperates with the spring member 43 to wind the electrical wire 41 into the receiving space 31 after use, wearing of the outer layer of the  
15       electrical wire 41 can be similarly avoided due to the presence of the second roller 52.

      It should be noted that left and right sides 323, 324 (see Figure 4) of the through hole 32 in the housing 3 can be further provided with additional rollers having  
20       structures substantially similar to the first and second rollers 51, 52. In another embodiment, only the first side 321 of the through hole 32 is provided with the first roller 51. According to test results, the electrical wire 41 is most susceptible to wearing at  
25       the first side 321 (i.e., the upper side) of the through hole 32. Therefore, protection provided at the first side 321 of the through hole 32 is adequate to achieve

the effect and advantage of the present invention.

While the present invention has been described in connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.